

# Demonstration of a Plug and Play Approach to Satellite Thermal Control System Development, Phase I

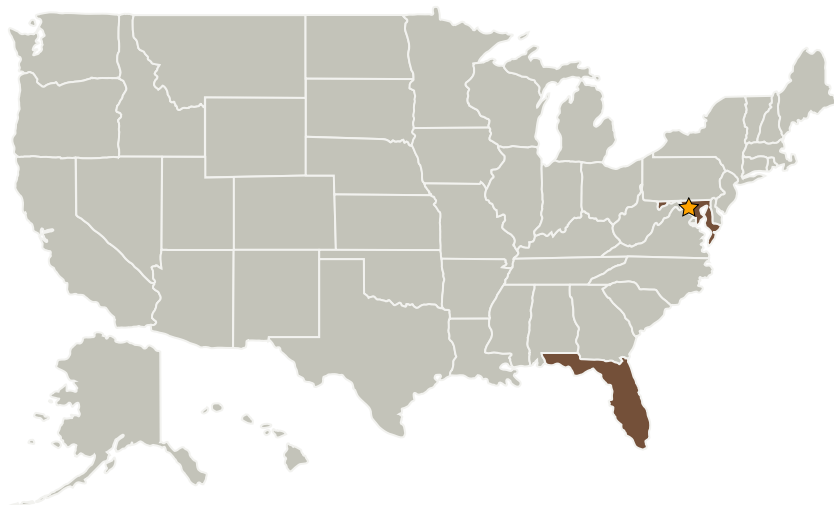
Completed Technology Project (2007 - 2007)



## Project Introduction

Mainstream is proposing a methodology to reduce the development time and cost, and improve the reliability of future thermal control systems for the next decade of deep space missions by utilizing a Plug-and-Play (PnP) thermal control strategy. A unique modular thermal control approach is described in the proposal as well as discussions why such an approach is ideally suited to reducing the development time and cost of deep space satellite thermal control systems as well as power conversion systems. Phase I will experimentally demonstrate that the proposed PnP approach can be configured to provide design flexibility, long life and extremely high reliability. With potential missions to Europa, Venus, and Titan, as well as primitive bodies, the PnP approach can simplify thermal control design while utilizing very compact, reliable, two-phase thermal control bus architecture. In this Phase I effort, Mainstream will demonstrate a unique PnP Tool-Box approach where the thermal control system is easily built-up into a complete integrated system, as well as being integrated into the power conversion components. Highly integrated systems will reduce cost, reduce system size, improve reliability, and tighten the thermal control.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Goddard Space Flight Center (GSFC)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Mainstream Engineering Corporation	Supporting Organization	Industry	Rockledge, Florida

## Primary U.S. Work Locations

Florida	Maryland
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## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX14 Thermal Management Systems
  - └ TX14.2 Thermal Control Components and Systems
    - └ TX14.2.3 Heat Rejection and Storage